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ABSTRACT

This annotated bibliography is a resource guide designed to assist schools in promoting the interest, engagement, and achievement of all students, especially those populations (poor, immigrant, female, and minority) that are underrepresented among students who elect advanced mathematics and science courses and pursue related careers. These materials have been carefully screened and selected for their usefulness in reviewing the curriculum, evaluating instructional materials, conducting professional development, and promoting parent/school partnerships. Many can be used directly with students in the classroom. There are three sections to this guide. Part 1, "Print Materials," provides information to assist educators in exploring the underlying causes and subtle barriers that discourage so many students from recognizing the relevance and usefulness of science and math to their lives and future careers. Part 2, "Resources for Career Information," lists information on careers in science and technology published in booklet or pamphlet form by associations, professional societies, nonprofit groups and corporations; the pamphlets are grouped together under the name of the publisher or the originator. Part 3, "Films, Videotapes, Slides and Audio Tapes," supports the work of integrating gender and cultural diversity into the classroom and of providing professional development for educators. Each entry provides a brief annotation regarding content, format and grade level (elementary, secondary, staff development and postsecondary; general, wide appeal, appropriate for use with parents, community members, youth groups and board members.) (An index for audiovisual materials contains items categorized by subject headings.) (MKR)

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Equity Materials in Mathematics, Science, & Technology

A Resource Guide

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EQUITY MATERIALS IN MATHEMATICS, SCIENCE & TECHNOLOGY

A RESOURCE GUIDE

Marylin A. Hulme

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Mathematics and Science Education
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INTRODUCTION

This Resource Guide is designed to assist schools in promoting the interest, engagement and achievement of all students, especially those populations--poor, immigrant, female and minority--that are underrepresented among students who elect advanced mathematics and science courses and pursue related careers. These materials have been carefully screened and selected for their usefulness in reviewing the curriculum, evaluating instructional materials, conducting professional development, and promoting parent/school partnerships. Many can be used directly with students in the classroom.

This listing may be useful in two ways. First, it alerts the reader to the existence of materials that, because of their specialized nature and because many are published by small presses, are not generally known or available to educators. The annotations provide information that can be used for individual or library purchase. Second, all materials listed are included in the collection at the Resource Center and are available for borrowing. For further information call (908) 932-2071.

There are three sections to this guide. Part I, Print Materials, provides information to assist educators in exploring the underlying causes and subtle barriers that discourage so many students from recognizing the relevance and usefulness of science and math to their lives and future careers. Among the topics are: differential treatment and expectations; career options and vocational education; classroom management and teacher-student interaction; multicultural inclusion; and, of course, equity programs specifically in mathematics, science and technology.

Part II, Resources for Career Information, lists information on careers in science and technology published in booklet or pamphlet form by associations, professional societies, nonprofit groups and corporations. For easy access, the pamphlets are grouped together under the name of the publisher or the originator. A single copy is usually sent free when requested on school letterhead. A complete list from the publisher will usually be sent on request.

Part III, Films, Videotapes, Slides and Audio Tapes, supports the work of integrating gender and cultural diversity into the classroom and of providing professional development for educators. Each entry provides a brief annotation regarding content, format and grade level (**E** = Elementary, K-6; **S** = Secondary, 7-12; **SD** = Staff Development and Post secondary; **G** = General, wide appeal, appropriate for use with parents, community members, youth groups and board members.) The titles are indexed under broad subject headings. Unless otherwise indicated, all videotapes are in ½" VHS format. An index follows to enable the user to gain access by subject headings.

I. PRINT MATERIALS

Achievement and Participation of Women in Mathematics: An Overview. Jane M. Armstrong. Denver: Education Commission of the States, 1980.

Report of a two-year study. Identifies the major factors relating to the problems of women's involvement in mathematics and suggests strategies to increase their participation.

Alice in Puzzle-Land: A Carrollian Tale for Children under Eighty. Raymond Smullyan. New York: Penguin Books, 1982.

Range of puzzles dealing with word play & logic, mathematics & philosophy, featuring Alice and the creatures of Wonderland.

America Street: A Multicultural Anthology of Stories. New York: Persea Books, 1993.

This anthology of short stories by American writers examines the complex experience of growing up in this diverse society. Some are recently immigrated here and some are born here; all are facing the realities of home and school and trying to make a place for themselves.

Background Materials and Curriculum Resources to Encourage Females into the Field of Mathematics, Science and Technology: An Annotated Bibliography. Toronto, Canada: Ontario Women's Directorate, 1993.

Beyond Equals: To Encourage the Participation of Women in Mathematics. Ruth Afflack. Oakland, CA: Mills College Math/Science Network, 1982.

Written for instructors of adult women, this handbook encourages students to continue studying mathematics and provides them with appropriate skills and activities; could be used with high school students.

Blacks in Science. Ivan Van Sertima, ed. New Brunswick, NJ: Transaction Books, 1983.

Part 1 examines recent research on early African science, medicine and technology outside Egypt; Part 2 looks at the experience and contributions of African-Americans to science and technology in the United States.

Blacks, Science, and American Education. Willie Pearson and H. Kenneth Bechtel, eds. New Brunswick, NJ: Rutgers University Press, 1989.

Examines data, policy recommendations and research to delineate the lack of Blacks in science and to suggest practical programs and policies for improving the situation in the future.

Breaking the Barriers: Helping Female and Minority Students Succeed in Mathematics and Science. Beatriz Chu Clewell and others. San Francisco: Jossey-Bass, 1992.

First half of this book focuses on barriers to achievement and participation in mathematics and science, with some interventions strategies; the second half discusses the delivery systems - their structure, responsiveness and implementation.

Breaking The Science Barrier: How to Explore and Understand the Sciences. Sheila Tobias and Carl T. Tomizuka. New York: College Entrance Examination Board, 1992.

Explores the fundamentals of understanding science: the vocabularies of science; approaching the study of biology, chemistry, physics and genetics. Discusses the ways in which science is taught to undergraduates.

Building Success in Math. Carol R. Langbort and Virginia H. Thompson. Belmont, CA: Wadsworth Publishing, 1985.

Using materials developed for an adult continuing education course, this book enables people from varied backgrounds and different levels of math to "restart their matn engines" and to succeed in problem-solving in a variety of mathematical areas.

A Challenge of Numbers: People in the Mathematical Sciences. Bernard L. Madison and Therese Hart. Washington, DC: National Academy Press, 1990.

Through data collection and analyses of surveys, this report describes human resources in the mathematical sciences; examines majors in math and statistics, mathematical scientists in the workplace and the role played by colleges and universities.

Changing America: The New Face of Science and Engineering, Final Report. Washington, DC: Task Force on Women, Minorities, and the Handicapped in Science and Technology, 1990.

Computer Equity in Math and Science: A Trainer's Workshop Guide. Jo Sanders and Mary McGinnis. Metuchen, NJ: Scarecrow Press, 1991.

Detailed guide to conduct an introductory workshop on gender equity in computer education applied to curricular areas of math and science includes activities and resources.

The Computer Explosion: Implications for Educational Equity. Sheryl Denbo, ed. Washington, DC: Mid-Atlantic Centers for Race and Sex Equity, 1983.

Examines the impact of computer technology and programs in the classroom, on curriculum and on access by girls and boys.

Cooperative Learning and Mathematics: A Multi-Structural Approach. Beth Andrinin and Spencer Kagan. San Jauna Capistrano, CA: Resources for Teachers, 1989.

Provides multi-structural lesson plans for specific academic outcomes in mathematics using cooperative learning as an instructional technique.

Double Dilemma: Minorities and Women in Science Education. Jane Butler Kahle. West Lafayette, IN: Purdue University, 1982.

Describes a cooperative project run in Alabama and Indiana to encourage and support minorities in science in higher education; includes statistics on women in science.

EdTalk: What We Know About Science Teaching and Learning; What We Know About Mathematics Teaching and Learning. Washington, D.C.: Council for Educational Development and Research, 1993.

Useful and up-to-date information on the pedagogy of math and science is arranged in a question and answer format; includes materials, equity, assessment, teachers and parental involvement.

Educating Americans for the 21st Century. National Science Board Commission on Precollege Education in Mathematics Science and Technology. Washington, DC: National Science Foundation, 1983.

A plan of action for improving mathematics, science and technology education for all American elementary and secondary students so that their achievement may be the best in the world by 1995.

Elementary and Secondary Education for Science and Engineering: a Technical Memorandum. Washington, DC: Congress of the United States, Office of Technology Assessment, 1988.

Analyzes recruitment into and retention in the science and engineering pipeline; highlights successful strategies and programs and includes comparative data.

Equity and Excellence: Compatible Goals, an Assessment of Programs that Facilitate Increased Access and Achievement of Females and Minorities in K-12 Mathematics and Science Education. Shirley M. Malcom. Washington, DC: American Association for the Advancement of Science, 1984.

Evaluation Counts: A Guide to Evaluating Math & Science Programs for Women. Barbara Gross Davis and Sheila Humphreys. Oakland, CA: Mills College Math/Science Network, 1983.

Provides basic tools and practices of evaluation geared towards math and science programs for women; includes overview of intervention programs and specific evaluation strategies.

Feminine Ingenuity: Women and Invention in America. Anne L. Macdonald. New York: Ballantine, 1992.

Fascinating history of women inventors granted patents is presented within a historical and social context; demontrates clearly that women, even when hobbled by social morés and stereotypes, could and did produce an astonishing array of inventions.

Feminism and Science. Nancy Tuana, ed. Bloomington, IN: Indiana University Press, 1989.

Addresses the scope of gender bias in science, the ways in which science is affected by and also reinforces sexist biases; examines feminist critiques on the practice of science.

"Feminism and Science", *Hypatia*, 3:1, Spring, 1988. Special issue.

Examines the issues of gender in science, of surface inequities in reality based on the complex structure of bias, and continues with an analysis of the scientific method from a feminist perspective.

Formula for Reform: The Role of the Comprehensive University in Science and Engineering Education. John C. Wright, ed. Washington, DC: American Association of State Colleges and Universities, 1989.

Reviews the role to be played by public colleges in science education, including teacher training and re-training; includes a resource section of programs available throughout the country.

Futures Unlimited: Expanding Choices in Nontraditional Careers. Arlene S. Chasek. New Brunswick, NJ: Rutgers University, Consortium for Educational Equity, 1985.

Illustrated by photographs of actual conferences this handbook, provides a step-by-step approach to planning and conducting a Futures Unlimited conference for 7-12 graders; targets female students to encourage them to continue studying math and science.

Garbage Pizza, Patchwork Quilts, and Math Magic: Stories About Teachers Who Love to Teach and Children Who Love to Learn. Susan Ohanian. New York; W.H. Freeman, 1992.

Describes new initiatives to teach mathematics in K-3 classrooms around the country.

G A S A T 4, Girls And Science And Technology: Proceedings of the Fourth GASAT Conference, 1987. Jane Butler Kahle and others, eds. West Lafayette, IN: Purdue Univeristy, 1988.

Proceedings and papers from this international conference address issues of science and technology education for girls in many different countries and cultures.

G A S A T 5, Gender And Technology: Contributions to the Fifth International Conference, 1989. Haifa, Israel: Technion - Israel Institute of Technology, 1990.

Papers discuss issues of gender equity in pre-college education, the participation of women in science and engineering, and workplace and "pipeline" concerns.

Gender and Mathematics: An International Perspective. Leone Burton, ed. London: Cassell Educational, 1990.

Collection of papers from I.O.W.M.E. reflect the range of work linking gender and mathematics around the world; introduces methodologies and questions that are relevant to different cultures.

Girls Count in Math and Science: A Handbook for Teachers. Mary Barnes and others. Darlinghurst, NSW, Australia: Mathematical Association of NSW, Girls and Mathematics Action, 1984.

Provides strategies and activities to increase girls' participation in math and science in high schools, with a section for parents; includes Australian data.

Girls into Maths Can Go. Leone Burton, ed. London: Holt, Rinehart and Winston, 1986.

These papers review and contrast the situation in the U.S. and the U.K. with reference to math anxiety, and gender in maths education.

Handbook for Conducting Equity Activities in Mathematics Education. Helen Neely Cheek, ed. Reston, VA: National Council of Teachers of Mathematics, 1984.

Abstracts from conference presentations designed to assist educators deal with equity issues in mathematics education; includes organizing conferences for students and teachers, classroom strategies.

Handbook on Improving the Retention and Graduation of Minorities in Engineering. Raymond B. Landis, ed. New York: National Action Council for Minorities in Engineering, 1985.

Addresses problems specific to Black, Hispanic and Native American students and the barriers which prevent them from succeeding in engineering; lacks coverage of the special problems of the minority female.

How to Encourage Girls in Math & Science. Joan Skolnick and others. Englewood Cliffs, NJ: Prentice-Hall, 1982.

Examines effects of sex role socialization on girls from childhood into high school; provides strategies to develop math and science skills; particularly useful for parents.

Images of Science: A Summary of Results From the 1981-82 National Assessment of Science. Stacey J. Hueftle. Minneapolis: University of Minnesota Science Assessment and Research Project, 1983.

National random sample of 9-, 13-, and 17-year-old students tested for response to science content and attitude; results analyzed by sex and race.

Improving Science Education Through Local Alliances, A Report to Carnegie Corporation of New York. Myron J. and Ann Atkin. Santa Cruz, CA: Network Publications, 1989.

Study focuses on new, inter-institutional approaches to the improvement of science education, K-12, examining relationships between schools, industry, universities and other organizations.

Innumeracy: Mathematical Illiteracy and Its Consequences. John Allen Paulos. New York: Hill & Wang, 1988.

General inability of people to deal rationally with large numbers, or with the probabilities and statistics associated with them, results in misunderstandings, misinformation, and also a reluctance to come to grips with growing math illiteracy.

An International Review of Gender and Mathematics. Erika Schildkamp-Kuendiger. Columbus, OH: ERIC Clearinghouse for Science, Mathematics and Environmental Education, 1982.

Reports from researchers provide comparative information on the issue of mathematics and gender from Australia, Canada, Dominican Republic, England, Wales, India, Ireland, Israel, New Zealand, and United States.

Intervention Programs in Math, Science, and Computer Science for Minority and Female Students in Grades Four through Eight. Beatriz Chu Clewell and others. Princeton, NJ: Educational Testing Service, 1987.

Directory of programs describes criteria for their nomination and selection; evaluation identifies successful delivery models and pinpoints gaps in service.

Investing in Human Potential: Science and Engineering at the Crossroads. Marsha Lakes Matyas and Shirley M. Malcom. Washington, DC: American Association for the Advancement of Science, 1991.

Examines efforts by higher education to increase participation of women, non-Asian minorities and people with physical disabilities in science and engineering.

The Levels of Mathematics Achievement. Mary Lyn Bourque and Howard H. Garrison. Washington, DC: National Assessment Governing Board, 1991. 1, National and State Summaries; 2, State Results for Released Items.

Mathematics and Gender. Elizabeth Fennema and Gilah C. Leder, eds. New York Teachers College, Columbia University, 1990.

Longitudinal studies provide better understanding of how girls and boys learn mathematics and explains why they learn differently; includes cross-cultural perspective on Australian research.

Mathematics and Science: Critical Filters for the Future of Minority Students. DeAnna Banks Beane, ed. Washington, DC: Mid-Atlantic Center for Race Equity, 1985.

Surveys the factors underlying the underrepresentation of Blacks, Hispanics and Native Americans in advanced math and science courses, and presents resources and strategies to support change.

The Mathematics Report Card: Are We Measuring Up? Princeton, NJ: Educational Testing Service, 1988.

Trends and achievement based on the 1986 National Assessment answers the question "no"; too many students lack mathematical reasoning skills to work effectively both in higher education and in the work place.

Measuring Up: Prototypes for Mathematics Assessment. National Research Council. Mathematical Sciences Education Board. Washington, DC: National Academy Press, 1993.

Prototypes of tasks created to assess fourth graders' mathematical skills and knowledge, reflecting demands of the NCTM standards.

Multiplying Options and Subtracting Bias: An Intervention Program Designed to Eliminate Sexism from Mathematics Education. Elizabeth Fennema and others. Reston, VA: National Council of Teachers of Mathematics, 1981.

This facilitator's guide contains outlines of workshops for students, teachers, counselors and parents; includes overhead masters and activities. Topics include math anxiety and avoidance, counseling for the math anxious and sex role stereotyping in mathematics. There are four videocassettes to accompany each workshop.

National Center for Improving Science Education Reports. Andover, MA: The NETWORK, 1990.

Assessment in Science Education: The Middle Years; Science and Technology Education for the Middle Years; Developing and Supporting Teachers for Science Education in the Middle Years.

National Science Education Standards: A Sampler. National Committee on Science Education Standards and Assessment. Washington, DC: National Research Council, 1992.

No Gift Wasted: Effective Strategies for Educating Highly Able Disadvantaged Students in Mathematics and Science. Judith Alamprese and Wendy Erlanger. Washington, DC: COSMOS Corporation, 1989.

Analyzes district-wide as well as building level efforts to develop disadvantaged students' academic skill and creative talent in math and science; includes case studies.

Nurturing At-Risk Youth in Math and Science: Curriculum and Teaching Considerations. Randolf Tobias, ed. Bloomington, IN: National Educational Service, 1992.

Assists teachers to infuse different strategies and extended curriculum components to raise students' interest in math and science, and to increase their self-confidence and self-esteem. Discusses issues of race and ethnicity but not gender.

Nurturing Science and Engineering Talent: A Symposium. Philadelphia, PA: The Franklin Institute; Washington, DC: National Academy of Sciences, 1986.

Results of symposium discuss science and engineering talent pool, factors in career choice and the importance of intervention programs, especially for women and minorities.

Options for Girls: A Door to the Future, an Anthology on Science and Math Education. Meg Wilson, ed. Austin, TX: pro-ed, 1992.

Anthology of key articles published in the last ten years on sex differences and gender equity in math and science; a valuable collection.

Paths to Program for Intervention: Math Anxiety, Math Avoidance, Reentry Mathematics. Washington, D.C.: Institute for the Study of Anxiety in Learning, 1980.

Persistence in Science of High-Ability Minority Students. Thomas Hilton and others. Princeton, NJ: Educational Testing Service, 1988.

Analysis of surveys and follow-up questionnaires show that high ability minority students persist in math, science and engineering fields to a high degree; identifies characteristics for success.

Proceedings of the National Conference on Women in Mathematics and the Sciences. Sandra and Philip Keith, eds. St. Cloud, MN: St. Cloud State University, 1990.

Papers provide up-to-date information and research on women and minorities in math, science and engineering; includes model programs, outreach, promotion and "glass ceiling" information.

Promoting Success Through Collaborative Ventures in Precollege Science and Mathematics. New York: National Action Council for Minorities in Engineering; National Association of Precollege Directors, 1985.

Lists and describes programs whose aim is to bring students to math and science study who would not otherwise be there; specifically targets minority groups.

Realizing the Potential of Women and Minorities in Engineering: Four Perspectives from the Field. Jane Zimmer Daniels and others. Washington, DC: National Governors' Association, 1990.

Results of the project by the NGA to identify successful intervention strategies and to translate them into a state action agenda.

Reflections on Gender and Science. Evelyn Fox Keller. New Haven: Yale University Press, 1984.

Nine essays examine the "genderization of science" from historic, psychoanalytic and scientific perspectives, reflecting on sexual division of labor where science remains a masculine preserve.

Report on the 1985-86 National Survey of Science and Mathematics Education. Iris R. Weiss. Research Triangle Park, NC: Research Triangle Institute, 1987.

Research survey provides information on science and math courses offered, textbooks used, instructional objectives, use of calculators and computers, and teacher education and qualifications.

Results From the Second Mathematics Assessment. Thomas P. Carpenter and others. Reston, VA: National Council of Teachers of Mathematics, 1981.

Item by item analysis points to overall decline in performance and provides a basis for the pattern of changes; includes information on race and gender differences in mathematics.

Science Achievement in Seventeen Countries: A Preliminary Report. International Association for the Evaluation of Educational Achievement. Oxford: Pergamon Press, 1988.

Presents initial results of science achievement tests of 10-, 14- and 17-year olds in 17 countries including U.S.A and Japan, and finds that U.S.A does poorly; some data on gender differences.

Science and Engineering Indicators, 1987. National Science Board. Washington, DC: National Science Foundation, 1988.

Broad base of quantitative analysis and information on science, engineering and technology provides excellent data on precollege science and math education; higher education for science; research, development and innovation; includes data by race and gender.

Science and Engineering Programs: On Target for Women? Marsha Lakes Matyas and Linda Skidmore Dix, eds. Washington, DC: National Academy Press, 1992.

Examines status of women in science and engineering, including programs specifically aimed at retaining women in postsecondary education and R and D employment.

Science and Gender: A Critique of Biology and Its Theories on Women. Ruth Bleier. New York: Pergamon Press, 1984.

Analyzes the role that science plays in maintaining the myth of women's biological inferiority; discusses ethnocentric and androcentric biases in scientific methodology, and describes the possibility of a feminist science.

Science Anxiety: Fear of Science and How to Overcome It. Jeffry V. Mallow. Clearwater, FL: H & H Publishing, 1986.

Written for students and teachers, as well as parents, this book examines science anxiety and recommends strategies to counteract it, helping to increase scientific literacy at all levels.

Science Assessment in the Service of Reform. Gerald Kulm and Shirley M. Malcom, eds. Washington, DC: American Association for the Advancement of Science, 1991.

This report addresses policy issues in science assessment, and how science assessment impacts on and is itself affected by curricular reform and instruction.

Science Experiences: Cooperative Learning and the Teaching of Science. Jack Hassard. Menlo Park, CA: Addison-Wesley, 1990.

Science experiences (or lessons) are described within the rubric of cooperative learning, and includes information for both student and teacher.

Science Matters: Achieving Scientific Literacy. Robert M. Hazen and James Trefil. New York: Doubleday, 1991.

Aimed at the general reader, this book provides information needed to become scientifically literate and knowledgeable about those topics of importance for a citizen of the technologically complex society.

Science Report Card: Elements of Risk and Recovery. Ina Mullis and Lynn B. Jenkins. Princeton, NJ: Educational Testing Service, 1988.

Uses trends in science proficiency to examine opportunities available to study science, nature of school science, home support of science learning and students' perceptions of science; data reported out by gender and ethnic group.

Science Report Card: NAEP's Assessment of Fourth, Eighth, and Twelfth Graders. Lee R. Jones and others. Washington, DC; U.S. Department of Education, 1992.

Parents further information documenting lack of preparation in science, and comparatively low acheivement of Blacks, Hispanics, females and economically disadvantaged students.

Sex and Ethnic Differences in Middle School Mathematics, Science and Computer Science: What Do We Know? Princeton, NJ: Educational Testing Service, 1985.

Reviews gender differences within ethnicity and examines factors related to achievement in math and science.

Sex and Scientific Inquiry. Sandra Harding and Jean F. O'Barr, eds. Chicago: University of Chicago Press, 1987.

Reconsiders science in light of new research in gender; examines the social structure of science and the bias extant in biology, sociology and technology.

Social Processes of Sex Differentiation in Mathematics. David R. Maines. Evanston, IL: Northwestern University Program on Women, 1981.

Study to determine the importance of role modeling occurring among males and females in mathematics and its function to reduce sex-biased inequities; main differentiation seems to lie in anticipated patterns of career and family participation.

Teacher Education and Mathematics: a Course to Reduce Math Anxiety and Sex Role Stereotyping in Elementary Education. Elaine B. Chapline and Claire M. Newman, eds. Newton, MA: Education Development Center, 1985.

A comprehensive approach that enables prospective teachers to reduce their own math-anxiety levels, to develop solid math teaching skills, and to create a positive classroom environment.

Teaching Mathematics: Strategies That Work, K-12. Mark Driscoll and Jere Confrey, eds. Portsmouth, NH: Heinemann, 1986.

Exemplary mathematics programs are described by teachers who created them, stressing importance of teacher-teacher interactions in order to solve common math teaching problems successfully.

Teaching Mathematics Effectively and Equitably to Females. Katherine Hansen. Newton, MA: Education Development Center, 1992.

*(Center for Equity and Cultural Diversity Working Paper, **1**).*

Teaching Science and Health From a Feminist Perspective: A Practical Guide. Sue V. Rosser. New York: Pergamon Press, 1986.

Examines changing pedagogical methods, as well specific curricular areas, to integrate gender into the curriculum as well as transforming classroom interaction.

The Third National Mathematics Assessment: Results, Trends and Issues. National Assessment of Educational Progress. Denver: Education Commission of the States, 1983.

Examines performance levels for 9-, 13-, and 17-year olds in mathematics over a period of 10 years; includes data by sex and ethnic origin.

Trends in the Selection of Science, Mathematics, or Engineering as Major Fields of Study Among Top-Scoring SAT Takers. Jerilee Grandy. Princeton, NJ: Educational Testing Service, 1987.

Examines choice of majors by top-scoring examinees, and finds few differences between the races but large differences between the sexes.

The Underachieving Curriculum: Assessing U.S. School Mathematics From an International Perspective. Curtis C. McKnight and others. Champaign, IL: Stipes Publishing, 1987.

Report of the Second International Mathematics Study examines teaching and learning of math curriculum, student achievement and attitudes of 13-year olds and those enrolled in advanced math in last high school year. (No statistics by sex.)

Understanding Sex/Ethnic Related Differences in Mathematics, Science and Computer Science for Students in Grades Four to Eight. Marlaine Lockheed and others. Princeton, NJ: Educational Testing Service, 1985.

Extensive review of the literature finds that little research has addressed gender differences within ethnicity, especially in the study of science and math at the middle school; recommends intervention programs.

Uneasy Careers and Intimate Lives: Women in Science, 1789-1979. Pnina G. Abir-Am and Dorinda Outram, eds. New Brunswick, NJ: Rutgers University Press, 1987.

Analyzes how the interplay between career and professional life has affected the participation of women in science; biographical studies of women scientists illustrate the personal and institutional difficulties suffered in different disciplines and places.

Use Equals to Promote the Participation of Women in Mathematics. Nancy Kreinberg and others. Berkeley, CA: University of California, Lawrence Hall of Science, 1980.

Handbook provides educators with strategies, activities, workshop models and resources to combat math avoidance and to encourage young women to continue math courses.

Wanted: More Women in Science and Technology, a Packet of Information and Suggestions for Junior and High School Counselors and Teachers Explaining the Importance of a Strong Background in Mathematics, Chemistry and Physics. New York: American Physical Society, Committee on the Status of Women in Physics, 1981.

Who Will Do Science? Sue E. Berryman. New York: Rockefeller Foundation, 1983.

Examines the statistics of women and five racial/ethnic groups in quantitative degrees up to the Ph.D. level in relation to the scientific talent pool and identifies causes of underrepresentation.

Women: Their Underrepresentation and Career Differentials in Science and Engineering. Washington, DC: National Science Foundation, 1987.

These proceedings examine the educational pipeline for girls in math and science, identifying negatives and citing positive efforts to ensure equitable treatment of girls and women, precollege to postgraduate.

Women and Minorities in Science: Strategies for Increasing Participation. Sheila M. Humphreys, ed. Boulder, CO: Westview Press, 1982.

Surveys current levels of participation by women and minorities in science study and careers, identifies barriers to participation and describes a wide range of intervention programs.

Women and the Mathematical Mystique. Lynn H. Fox and others, eds. Baltimore: Johns Hopkins University Press, 1980.

This expanded version of the A.A.A.S. symposium brings together recent research into sex differences in mathematics achievement and describes intervention programs.

Women in Science: A Report From the Field. Jane Butler Kahle, ed. Philadelphia: Falmer Press, 1985.

Papers discuss factors affecting female achievement and interest in science and scientific careers, from high school to the post-doctorate; women's roles in scientific organizations, discrepancies between women and men in science and the "double bind" for minority women are also explored.

Women in Science and Engineering: Increasing Their Number in the 1990's, A Statement on Policy and Strategy. National Research Council, Committee on Women in Science and Engineering. Washington, DC: National Academy Press, 1991.

Examines the science and engineering education infrastructure and effectiveness of intervention programs in order to sustain the recruitment and retention of women into science and engineering. Includes data on participation rate and career paths.

Women in Scientific and Engineering Professions. Violet B. Haas and Carolyn C. Perucci. Ann Arbor, MI: University of Michigan Press, 1984.

Conference papers examine career opportunities and the status of women professionals in science, social science and engineering; includes ideas and strategies to encourage and increase the participation of women in science.

Women, Minorities and the Disabled in Science and Technology. Hearing before the Subcommittee on Science, Research and Technology of the Committee on Science, Space and Technology, House of Representatives. Washington, DC: U.S. Government Printing Office, 1988.

Women Scientists in America: Struggles and Strategies. Margaret W. Rossiter. Baltimore, MD, Johns Hopkins University Press, 1982.

Examines women's efforts to gain significant education in the sciences and to enter the scientific world; emphasis is on research and academia.

A World of Differences: An International Assessment of Mathematics and Science. Archie E. LaPointe and others. Princeton, NJ: Educational Testing Service, 1989.

Random sample of 13-year old students from six countries selected to answer math and science tests resulted in comparative data showing poor performance by U.S. students.

Newsletters

AWIM Newsletter. Association for Women in Mathematics, PO Box 178, Wellesley College, Wellesley, MA 02181.

AWIS Newsletter. Association for Women in Science, 1346 Connecticut Avenue NW, Suite 1122, Washington, DC 20036.

Feminists in Science & Technology. Science and Technology Task Force of the National Women's Studies Association, PO Box 6793, Houston, TX 77265.

International Organization of Women and Mathematics Education: Newsletter. c/o Sherry Fraser, Lawrence Hall of Science, University of California, Berkeley, CA 94720.

U.S. Woman Engineer. Society of Women Engineers, 345 East 47th Street, New York, NY 10017.

Women and Mathematics Education Newsletter. c/o Charlene and James Morrow, Mt. Holyoke College, 302 Shattuk Hall, South Hadley, MA 01075.

II. RESOURCES FOR CAREER INFORMATION

Acoustical Society of America, 335 East Fourth Street, New York, NY 10017.
Careers in Acoustics

American Association for the Advancement of Science (AAAS), 1333 H Street, NW, Washington, DC 20005-4792.
A Day's Work, A Life's Work
(A series of reports based on visits with women chemists, mathematicians and engineers)
Career Opportunities in the Sciences
(Lists scientific organizations with addresses and career materials produced by them)
Notes for Parents
(Informational newsletter directed at parents to encourage their daughters to be interested in math and science)

American Association of Petroleum Geologists, PO Box 979, Tulsa, OK 74101; *and*
American Geological Institute, 5205 Leesburg Pike, Falls Church, VA 22041.
Careers in Geology
Careers in the Geosciences

American Chemical Society, 1155 16th Street, NW, Washington, DC 20036.
A Career as a Chemical Technician
Careers in Chemistry: Q & A
Careers in the Chemical Sciences
Chemical Careers in the Life Sciences

American Dental Association, 211 East Chicago Avenue, Chicago, IL 60611.
Careers in Dentistry for Women

American Forestry Association, P.O. Box 2000, Washington, DC 20013.
So You Want To Be in Forestry

American Geophysical Union, 2000 Florida Avenue, NW, Washington, DC 20009.
Careers in Geophysics
Careers in Oceanography
Our Home Planet

American Indian Science and Engineering Society, 1310 College Avenue, Suite 1220, Boulder, CO 80302.
American Indian Scientists and Engineers

American Institute of Aeronautics & Astronautics, 1290 Avenue of the Americas, New York, NY 10104.
Careers in Aerospace within Your Lifetime

American Institute of Chemical Engineers, United Engineering Center, 345 East 47th St., New York, NY 10017
The Chemical Engineer

American Institute of Physics; American Physical Society, Committee on the Status of Women in Physics, 335 East 45th Street, New York, NY 10017.
Physics: A Career for You
Physics in Your Future
Women in Physics

American Meteorological Society, 45 Beacon Street, Boston, MA 02108-3693.
The Challenge of Meteorology

American Physiological Society, 9650 Rockville Pike, Bethesda, MD 20814.
Careers in Physiology

American Society for Cell Biology, 9650 Rockville Pike, Bethesda, MD 20814.
Opportunities in Cell Biology

American Society for Microbiology, 1325 Massachusetts Avenue, NW, Washington, DC, 20005.
Microbiology: Challenges for the 21st Century
Your Career in Microbiology: Discovering the Secrets of Life

American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, NY 10017.
A Career for the Future

American Society for Metals, Metals Park, OH 44073.

American Statistical Association, 1806 15th Street, NW, Washington, DC 20005.
Careers in Statistics
Minorities! Looking for a Challenging Career? What about Statistics?
Statistics as a Career for Women

Biophysical Society, 9650 Rockville Pike, Bethesda, MD 20814.
Careers in Biophysics

Botanical Society of America, School of Biological Sciences, University of Kentucky, Lexington, KY 40506.
Careers in Botany

Carnation Co., Community Relations Department, 5045 Wilshire Boulevard, Los Angeles, CA 90036.
Career Vistas

Computer & Business Equipment Manufacturers Association, 311 First Street, NW, Washington, DC 20001.
Computer Careers

Dow U.S.A., Midland, MI 48674.
You Can Do Great Things at Dow - Chemical Engineers
- Electrical Engineers
- Information Systems

E.I. Du Pont De Nemours & Co., Wilmington, DE 19898.
What Mechanical Engineers do at Du Pont
What Electrical Engineers do at Du Pont

Eastman Kodak Co., Rochester, NY 14650.
Women in Engineering at Kodak

Electronic Industries Association, Consumer Electronics Group, 2001 Eye Street NW, Washington, DC 20006.
Electronics: Your Bridge to Tomorrow
Your Career as an Electronics Technician
Electronics Technician: A Career for Tomorrow

Engineers Council for Professional Development, 345 East Fourth Street, New York, NY 10017.
Series of pamphlets on different branches of engineering.

Exxon Co. USA, PO Box 2180, Houston, TX 77001.
Engineers

General Electric Co., Fairfield, CT 06431.
What's It Like to Be an Engineer
So You Want to Go to Work
What's It Like to Be a Technician
What's It Like Working with Computers

Institute of Electrical & Electronics Engineers (IEEE), 1828 L Street, NW, Suite 1202, Washington, DC 20036-5104.
Your Career in the Electrical, Electronics, and Computer Engineering Fields
Careers in Electrical and Electronics Engineering Technology
Careers in Electrical, Electronics, & Computer Engineering

Institute of Food Technologists, 221 North LaSalle Street, Chicago, IL 60601.
Your Future as a Food Scientist

International Business Machines (IBM), Old Orchard Road, Armonk, NY 10504.
Careers at IBM

International Paper Co., International Paper Plaza, 77 West 45th Street, New York, NY 10036.
Careers

JETS, Inc., 1420 King Street, Suite 405, Alexandria, VA 22314-2715.
Exploring the World of Tomorrow . . . Today: Engineering, Science and Technology Activities for High School Students

Manufacturing Chemists Association, 1825 Connecticut Avenue, NW, Washington, DC 20009.
Minority Engineers in the Chemical Industry

Mathematical Association of America, 1529 18th Street, NW, Washington, DC 20036.
Careers in Mathematics

Ms. Foundation for Women, 141 Fifth Avenue, Suite 6S, New York, NY 10010.
Who Do You Think You Are?
Take Our Daughters to Work Program

National Action Council for Minorities in Engineering, Three West 35th Street, New York, NY 10001.
Engineering, Your Key to the 21st Century
The Sky's Not the Limit

National Aeronautics and Space Administration (NASA), Lyndon B. Johnson Space Center, Houston, TX 77058.
NASA will send biographical information and photos of women and minority astronauts.

National Association of Trades and Technical Schools (NATTS), Department WW, PO Box 10429, Rockville, MD 20850.
Working Women: Opportunities for Women in Trade and Technical Fields

National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 22091-1593.
NCTM publishes three mathematics education periodicals and many varied special publications; catalogue available.

National Science Teachers Association (NSTA), 1742 Connecticut Avenue, NW, Washington, DC 20009.
NSTA publishes four science education magazines and nearly 100 special publications; catalogue available.

National Society of Professional Engineering, 2029 K Street, NW, Washington, DC 20006.
After High School, What?

Rochester Institute of Technology, One Lomb Memorial Drive, Rochester, NY 14623.
Image World: Careers in Graphic Communications

Sandia National Laboratories, Albuquerque, NM 87185.
Careers for Women in Science & Technology

Society of American Florists, 1601 Duke Street, Alexandria, VA 22314.
Careers in Floriculture

Society of Exploration Geophysicists, Committee for Women in Geophysics, PO Box 702740, Tulsa, OK 74170-2740.
Women Exploring the Earth

Society of Petroleum Engineers, 6200 North Central Expressway, PO Box 64706, Dallas, TX 75206.
Petroleum Engineering: Your Future in Energy

Society of Women Engineers, 345 East 47th Street, New York, NY 10017.
Engineering: A Goal for Women
WomanEngineer

United States Department of Labor, Bureau of Labor Statistics, Washington, DC 20202.
Occupational Outlook Handbook, (biennial) and *Occupational Outlook Quarterly*
Updated every two years, this handbook provides copious information (job descriptions, salaries, education and training requirements, and employment outlook) about numerous careers, including engineering, the natural sciences, the social sciences, technical and electronic fields, mechanics and medicine. The *Quarterly* provides short articles on new and developing careers, such as artificial intelligence. Government departments also publish their own career pamphlets; for example, *Career Profiles* from the US Forestry Service covers ecology and environmental management, and the U.S. Fish & Wildlife Service produces attractive career posters on wildlife management.

Westinghouse Electric Corp., Minority Youth Engineering Program, 6 Gateway Centre, Pittsburgh, PA 15222.
A New World

III. FILMS, VIDEOTAPES, SLIDES & AUDIO TAPES

Accelerated Schools For At-Risk Children. Palo Alto, CA: Stanford University, Center for Educational Research, 1989. videotape. 25 mins. **(SD)**

Explains concept of accelerated schooling for disadvantaged elementary students and demonstrates strategies for implementation of program.

All About Eve. Houston, TX: Equal Vocational Education Project, 1976. 16mm film. 10 mins. **(S)**

Presents women in nontraditional jobs, especially those in the areas of vocational education, such as auto mechanics, welding, television repair -- all careers for which girls might train in high school vocational programs.

All These Girls Used to Go to Co-ed Schools. New York: A.B.C. News, 1992. videotape. 12 mins. **(E)**

This news segment, reported by John Stossel, focuses on the problems girls face as a result of attending co-ed schools. It probes the underlying reasons for these problems, and presents suggestions for combatting them.

American Woman: New Opportunities. New York: Butterick Publishing, 1976. 2 filmstrips, 2 audio tapes. 12 minutes each. **(S)**

These filmstrips explore the roles, aspirations and experiences of women today. Women of differing backgrounds and job experiences talk about their lives and work.

Beginning Concepts: People Who Work, Unit I. Englewood Cliffs, NJ: Scholastic Book Services, 1975. 5 filmstrips, 5 cassette tapes. **(E)**

Career and life descriptions of the following people: a female Puerto Rican doctor working in a large urban hospital; a male baker who lives in a small town in Vermont; a woman quiltmaker in the Smokey Mountains who lives on a farm; a male park ranger in the Cape Cod National Seashore; and a manufacturer of toys in New England. All show family life, as well as work lives, and emphasize the role of wives, husbands and children within family units.

Being An Astronaut. New York: Children's Television Workshop, 1986. videotape. 29 mins. **(E)**

Four astronauts describe lift off and weightlessness, what it's like to go through astronaut training, what they do when they're not in space, and what paths they took to become astronauts.

Black Woman Inventors. Orlando, FL: Sylvestre C. Watkins,1983. videotape. 30 mins. **(S)**

Interviews Patricia C. Ives about the role of Black women inventors and their patents which are recorded at the U.S. Patent Office; uses pictures and drawings to demonstrate patent application process.

A Brain, Books and a Curiosity. Washington, DC: National Science Foundation, 1992. videotape + guide. 28 mins. **(S)**

Designed to stimulate young people's interest in science and math careers. African American and Latino role models discuss the importance of science in their lives and how they use it; highlights Edwin Moses talking about friction and Mae Jemison discussing gravity.

Breaking Tradition. Spartanburg, SC: Spartanburg Technical College, 1987. videotape. 22 mins. **(S)**

This recruitment and motivational video designed to encourage young women to enter technical fields presents high school seniors discussing the merits of attending "the tech"; interviews young women graduates who are working in a wide variety of electronics and computer-assisted jobs and enjoying it.

Careers in Energy. New York: Pathescope Educational Media; Associated Press, 1977. 2 filmstrips, 2 audio tapes + guide. 13 and 12 mins. **(S)**

Shows the great diversity of careers in the energy field, and discusses the requirements for a variety of jobs, from professional engineers to coal miners and offshore rig operators.

Careers in High Technology. Pittsburgh: University of Pittsburgh, Equity Resource Center, 1988. videotape + guide. 15 mins. **(S)**

Application of high technology through computers and electronics is shown in a variety of jobs; stresses entrepreneurship and the fact that most people will change their fields of work several times. Upbeat and well-paced video for middle school to high school career education.

Careers Related to Science. New York: Denoyer-Geppert Audio-Visuals, 1977. 3 filmstrips, 3 audio tapes + guide. **(S)**

Based on interviews with women and men working in science, this program shows how they started, what they think about work and how they work. Part I includes: meteorology, tool & die machining, chemical technology; Part II: drafting, nursing, gardening and National Park Service; Part III: pharmaceutical industry, dentistry, chemical engineering and medical illustration.

E = Elementary; S = Secondary; SD = Staff Development; G = General
Unless specified all videotapes are ½" VHS.

Careers in the World of Water. Phoenix, AZ: Arizona Cactus-Pine Girl Scouts, 1986. videotape. 12 mins. **(S)**

Interviews with women working in different areas with water include a water chemist, a hydrologist, and a ground water supply manager; all discuss their education and training and emphasize the importance of math and science in high school.

The Challenge: A Kid's Introduction to Engineering. New York: National Action Council for Minorities in Engineering (NACME), 1993. videotape + guide. 24 mins. **(E)**

Designed to introduce fourth to seventh graders to the wonders of engineering careers; this program is accompanied by activities and information to motivate students to continue studying math and science.

Chemists in the Classroom. Washington, DC: American Chemical Society, 1990. 13 mins. videotape. **(SD)**

Depicts a professional chemist and a classroom teacher working out a suitable and successful program for elementary students; points out pitfalls and then revises the scenario to create a promising program for all involved.

Choices and Changes. Kansas City, MO: McRel Sex Equity Center, 1987. videotape + guide. 60 mins. **(S)**

Teleconference features 4 professionals (pilot, architect, kindergarten teacher & nurse) in nontraditional careers discussing decisions they made concerning their education and training. Guide provides activities to teach decision-making process while considering nontraditional career options.

Competence Is For Everyone. Newton, MA: Education Development Center, 1978. 2 3/4" videotapes + guides: Judge Me, Not My Shell *and* The Rise of Rolag. **(S/SD)**

Purpose of this package is to specify and reduce limits on learning and use of skills experienced because of sex, race or ethnic discrimination, and is based on the process of making judgments; includes activities and reading selections.

The Computer Equity Expert Project. New York: Women's Action Alliance, 1993. videotape. 16 mins. **(SD)**

Examines gender balance in enrollment of math, science and technology courses, especially computer science courses; presents the project's strategies and research results which encourage girls to move into math, science and computer courses.

Cooperative Learning. Alexandria, VA: Association for Supervision and Curriculum Development, 1990. videotape. 36 mins. **(SD)**

Provides an overview with implementation strategies of three cooperative learning techniques: STAD (Student Teams-Achievement Divisions); TGT (Teams-Games-Tournaments); Jigsaw II, from the Johns Hopkins/Slavin model.

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Unless specified all videotapes are ½" VHS.

Count Me In: Educating Women for Science and Math. Oakland, CA: Mills College, 1978. videotape + guide. 30 mins. **(SD)**

This documentary of a comprehensive curricular/career model program at Mills College is designed to help women enter scientific and technical fields; though geared for college level, it is useful for senior high school.

Crisis: Who Will Do Science? New York: WNET; Rahway, NJ: Merck & Co., 1989. videotape + guide. 30 mins. **(S)**

Examines the historical role of African-Americans in science and possible reasons for their underrepresentation today. Provides teachers with career materials and role models to encourage Black students to continue studying science.

Cultural Diversity and Student Achievement: Effective Schools Conference; Dinner Speaker, Samuel Betances. Greenville, NC: TSCD Sight & Sound Production, 1988. videotape. 45 mins. **(SD)**

Discover: the World of Science, "King of the Mountain". New York: Scientific American Frontiers, 1991. videotape. 58 mins. **(S/SD)**

Students at the Massachusetts Institute of Technology learn by doing in the design engineering class; given a limited amount of materials and time, students must construct, test and refine a remote controlled machine to enter the "King of the Mountain" contest. Out of the textbook into the nitty gritty of engineering, the result approximates life in engineering.

Dreams of Flying. Sacramento, CA: Circle Project California State University, 1989. videotape. 28 mins. **(S)**

Young Chicana woman finds some unexpected opposition to her plans to study industrial technology at college; family members help to resolve the situation.

Effective Short-term Teacher Development in Science and Math Education. Portland, OR: Columbia Education Center, 1993. videotape. 60 mins. **(SD)**

A roundtable discussion at the National Science Teachers Association conference in Kansas City describes recent research on females and minority students achievement in math and science; this is followed by excerpts on several successful programs, funded by the Eisenhower program, to showcase training of teachers, including Family Science.

Engineering is for Everyone: A Science Education Program for Elementary Classes, Grades 3 through 6. New York: American Society of Mechanical Engineers, 1992. videotape. 12 mins. **(E)**

Young girl tells about her experience at a science museum camp, reluctant at first, she enjoys the activities, debunks the myths and says "math and science doesn't have to be scary".

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Unless specified all videotapes are ½" VHS.

Engineers: Turning Ideas into Reality. Alexandria, VA: National Society of Professional Engineers, 1990. videotape & guide. 8 mins. **(G)**

Attractive depiction of engineering jobs from magnetic resonance imaging to undersea exploration.

Expectations. Newton, MA: Education Development Center, 1984. videotape. 15 mins. **(G)**

Part of the training package Together We Can, *this video contains a series of scenes and images illustrating subtle and not-so-subtle forms of sex role stereotyping.*

Exploring Careers in Science and Engineering. Research Triangle Park, NC: Research Triangle Institute, 1982. filmstrip, audio tape + teacher's and student's guides. **(S)**

Science careers program describes the status of women and minorities in the science labor force and the many different jobs available; includes activities and strategies to encourage women and minorities to pursue science careers.

Failing at Fairness. New York: CBS News, 1992. videotape. 20 mins. **(SD)**

Following the research publicized in the AAUW's report "How Schools Shortchange Girls", Pauley's cinema verite of gender-biased classroom interactions are analyzed by Myra and David Sadker; this team of researchers point out how girls are overlooked and become invisible in the classroom, to the detriment of their education.

Family Science Highlights. Kenilworth, NJ: Kenilworth School District, 1989. videotape. 50 mins. **(G)**

Highlights of Kenilworth's exemplary Family Science program show parents and children participating in the activities; openers, main activities, and careers panel.

Forces and Motion. New York: Children's Television Workshop; Mount Kisco, NY: Guidance Associates, 1985. 3 videotapes. **(E/SD)**

1, Gravity (11 mins); 2, Buoyancy in Water (10 mins); 3, Buoyancy in Air (14 mins); 4, Human Forces (10 mins); 5, Forces at the Circus (11 mins).

Young people explore the scientific principles of centrifugal force, buoyancy and aerodynamics and demonstrate how pulleys and levers make lifting easier through hands on experiments.

FOSS: Full Option Science System. Berkeley, CA: University of California Lawrence Hall of Science, 1989. videotape. 8 mins. **(E/SD)**

Demonstrates a hands-on science program for 9-12 year old students, encouraging them in the "doing" of science and capturing their interest and enthusiasm. Kit and guide for each section is available from Lawrence Hall of Science.

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Unless specified all videotapes are ½" VHS.

Futures: From High School to High Tech. Portland, OR: Northwest Regional Laboratory, Center for Sex Equity, 1983. videotape + guide. 15 mins. **(SD)**

Creates an awareness of equity issues in high school for teachers and counselors; emphasizes the very different preparation needed by present-day students in order to cope with the high tech world.

Futures Unlimited I: Expanding Your Horizons in Mathematics and Science. New Brunswick, NJ: Rutgers University, Consortium for Educational Equity, and Office of TV and Radio, 1984. videotape. 29 mins. **(S)**

Based on the Futures Unlimited *conferences, this videotape demonstrates the critical connection between mathematics and future careers; six role models discuss their jobs, education and training.*

Futures Unlimited II: Expanding Your Horizons in Technical and Vocational Education. New Brunswick, NJ: Rutgers University Consortium for Educational Equity, and the Office of TV and Radio, 1985. videotape. 29 mins. **(S)**

Profiles five women working in high-paying trades and technologies, who talk about their training, personal lives and career goals.

Futures Unlimited III: Just Between Sisters. New Brunswick, NJ: Rutgers University, Consortium for Educational Equity, and the Office of TV and Radio, 1986. videotape. 29 mins. **(S)**

Set during a career day in a high school library, program shows minority women describing their technical jobs and the paths they took to obtain them.

Gateway to the Future. Chicago: National PTA, 1989. videotape + guide. 10 mins. **(SD/G)**

Discusses myths about math with parents, and encourages them to play a major role in fighting math illiteracy and in exploding harmful myths. Good for staff development and parents as partners programs.

Grassroots Science: Set I, Beginning. Chicago: Denoyer-Geppert Audio-Visuals, 1977. 4 filmstrips, 4 audio tapes + guide. **(E)**

Information and close-up photographs enable children to see development of young creatures, such as tadpoles to frogs, and the hatching of a chick. Useful introduction to sex education.

How High the Sky? How High the Moon? Women Scientists Today. Newton, MA: Education Development Center, n.d. 4 audio tapes + script and book. **(S)**

This program assists girls to learn and prepare for scientific and technical jobs; includes interviews with women scientists about their work and personal lives.

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Unless specified all videotapes are ½" VHS.

I'm Going to Be... Berkeley, CA: University of California Extension Media Center, 1977. 16mm film. 20 mins. **(G)**

With a little bit of magic, a girl and a boy find out all about different types of engineers, both female and male including minorities; useful for elementary career education and staff development.

Innovation: The Next Generation. New York: Public Broadcasting System, 1993. videotape. 58 mins. **(S)**

Interviews with three young people defy the stereotype of who does science and clearly identifies the importance of parental support and interest in helping young women and students from ethnic groups to maintain an interest in science. These are interspersed with monologues from established people in science, Guy Bluford, Jonas Salk and Antonio Novello.

Intern: A Long Year. Chicago: Encyclopedia Britannica Educational Corporation, 1972. 16mm film. 20 mins. **(G)**

Shows a woman intern experiencing day-to-day occurrences in an inner city hospital, rotating through different departments; includes her home and social life. (Note: some scenes are not for the fainthearted.)

It's Her Future. Newton, MA: Education Development Center, 1980. 16mm film + guide. 18 mins. **(S/G)**

This film introduces girls and their parents to vocational education, focusing on opportunities in nontraditional jobs and the fact that most women will work in the labor force for 25 to 30 years.

Let's Look at Logic. New York: Guidance Associates, 1977. 2 filmstrips, 2 audio tapes. 32 mins. **(E)**

Filmstrip set presents children with basic concepts of logic, and includes the proposition that "girls can't understand logic." Introduces formal deductive logic and the use of a Venn diagram. Set includes logic cards for student use.

Life and Times of Rosie The Riveter. Los Angeles: Direct Cinema, 1987. videotape. 65 mins. **(G/S) (SEED)**

Excellent and moving account of women's entry into the labor force, especially into production during World War II; shows how what is considered "women's work" and "men's work" changes with national needs; includes government propaganda pieces, archival films and posters.

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Unless specified all videotapes are ½" VHS.

Look Who's Working Here: Materials for Overcoming Sex Bias and Stereotyping in Occupational Education. Mount Vernon, NY: Mid-Hudson Regional Project to Promote Sex Equity in Occupational Education, 1981. filmstrip, audio tape + guide. **(S)**

Designed to assist students to broaden their horizons and to consider nontraditional courses and jobs; the handbook could also serve for inservice on recruitment.

The topics covered are stereotypes, what they are, how they evolved, how they are learned, and the current views on stereotypes and sex roles.

Math: A Four Letter Word. Wimberly, TX: Public Films, 1990. videotape + book. 20 mins. **(E)**

Encourages children to enjoy math by asserting its practical uses and demonstrating interesting hands-on activities; includes helpful tips for teachers and parents.

Math: Who Needs It? Alexandria, VA: FASE Productions; Public Broadcasting System, 1991. videotape. 58 mins. **(E)**

*Gives children **and** their parents a new perspective on the rewards and opportunities open to anyone with good math skills; destroys myths and misconceptions about math and presents it in a positive light.*

Math... You Can Count on It. Washington, DC: Mathematical Association of America, 1988. videotape. 15 mins. **(G)**

Shows students enthusiastically dealing with everyday math problems with the help of calculators and enjoying it. Designed to encourage students in math, it demonstrates influences of math in everyday life.

Mathco. Newton, MA: Education Development Center, 1982. 6 vols, 5 filmstrips, 6 audio tapes and posters. **(S)**

This multimedia package provides challenging and attractive activities and strategies to work with math and reduce anxiety; especially appropriate for working with girls to feel competent in math.

Mathematics: Gateway to Future Careers. Reston, VA: National Council of Teachers of Mathematics, 1981. filmstrip, audio tape + guide. 15 mins. **(S)**

Illustrates numerous math-related careers and discusses use of math in students future. Lacks nontraditional perspective.

Mathematics in Art/Art in Mathematics. New Brunswick, NJ: Rutgers University, Consortium for Educational Equity; Montclair, NJ: Montclair Art Museum, 1986. binder. slides. **(S/SD)**

An enrichment program for high school students, which uses art to enhance visual-spatial skills, and math to increase appreciation of design; includes slides and diagrams of select art and craft works.

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Unless specified all videotapes are ½" VHS.

The Math/Science Connection. San Francisco: Mills College, Math/Science Network, 1979. 16mm film and videotape. 25 mins. **(SD)**

Excellent film depicts strategies in mathematics and science to encourage girls and women to learn and enjoy those subjects.

Mrs. Cop. Carol Stream, IL: Spectrum Motion Picture Laboratory, 1977. 16mm film. 17 mins. **(S)**

Mary Ellen Abrecht is a police sergeant; the film shows her inspecting firearms, chairing a departmental meeting, etc.

Mrs. Fenwick Went To Washington. Trenton, NJ: New Jersey Network, 1992. videotape. 29 mins. **(G)**

The political biography of Millicent Fenwick, who, after being elected to local and state offices, served in Washington as a well-respected congresswoman from New Jersey. She also served as U.S. ambassador to the U.N. Food and Agriculture Organization.

Multiplying Option and Subtracting Bias: An Intervention Program Designed to Eliminate Sexism From Mathematics Education. Reston, VA: National Council of Teachers of Mathematics, 1981. 2 videotapes + guide. **(S/SD)**

The facilitator's guide contains outlines for workshops for students, teachers, counselors and parents; includes overhead masters and activities.

Never Underestimate the Power of a Woman. Madison, WI: University of Wisconsin Extension, Bureau of Audio-visual Instruction, 1975. 16mm film. 15 mins. **(S)**

This film brings attention to nontraditional jobs, especially those of the factory and craft workers; shows women's participation in training for various craft jobs.

Non-Traditional Careers for Women. New York: Pathescope Educational Films, 1974. 2 filmstrips, 2 audio tapes. **(S)**

Descriptions of and interviews with women in nontraditional careers, ranging from chef to architect, from installer to engineer.

Nothing But Options. Oakland, CA: Math/Science Network, Mills College, 1984. videotape + guide. 18 mins. **(S)**

Profiles five young women in math and science careers: environmental science; computer systems analysis; electrical engineering; computer graphics, and financial investments.

Opportunities in Science and Engineering. Washington, DC: Scientific Manpower Commission, 1980. boxed slides, audio tape and guides. **(S)**

Designed for use with high school and undergraduate students, information on scientific and engineering careers is presented.

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Unless specified all videotapes are ½" VHS.

Passwords: Skill & Talent. Hartford, CT: Connecticut Department of Education, Bureau of Vocational Program Planning and Development, 1983. videotape + guides. (Total running time, 45 mins. in segments of 10-15 mins.; guides in English and Spanish for leaders and participants.) **(SD)**

Film segments supported by activities lead educators through events concerning enrollment in nontraditional courses; particularly useful for educators working with minority youth in urban areas.

Physics: A World of Opportunities. Toronto, Ont: York University; Oakland, CA: Math/Science Network, 1987. videotape. 10 mins.

Presents special program at York University to introduce high school girls to physics, with lab sessions, lectures, and opportunity to meet role models.

Physics: It's Also Me... New York, NY: American Physical Society, 1989. videotape. 14 mins. **(S)**

Physics professors discuss new topics in physics with their students and dispel myths about what physics is and who does physics; a motivational approach to recruitment. (multiethnic).

Project on Sex Stereotyping in Education. Newton, MA: Education Development Center, 1978. 13 modules, 13 audio tapes. **(SD)**

Instructional units on sex role stereotyping for teachers and teacher educators in a variety of subject areas provide awareness and information; to be used as supplementary materials.

Project Seismic. New York: C.U.N.Y., 1981. 4 videotapes. **(SD)**

Issues in sex equity; The legal framework: sex equity on trial; Curriculum: person to person; Curriculum/community: new on the job.

Proyecto Futuro. Making Math and Science Work for Hispanics. Washington, D.C.: American Association for the Advancement of Science, 1992. videotape. 15 mins. **(SD)**

After establishing the low enrollment of Hispanics throughout the math/science pipeline, this tape identifies some of the barriers and describes strategies to increase Hispanics' involvement in math, science and engineering. Presents role models and innovative classrooms.

Putting It All Together: A Model Program for Women Entering Engineering. Newton, MA: Education Development Center, 1982. slide carousel, audio tape + guide. 15 mins. **(S)**

Features program at Purdue University to encourage and support young women in engineering; provides and interaction with role models and information on careers.

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Unless specified all videotapes are ½" VHS.

Questions. New York: Girls Club of America, 1987. videotape. 8 mins. **(E)**

Motivational program to encourage participation in Operation SMART, a hands-on science program for urban minority girls.

REACH Awareness: Respecting Our Ethnic and Cultural Heritage. Wichita, KS: KEDDS Link, 1989. videotape + guide. 45 mins. **(E)**

This model program demonstrates how to deal positively with diversity in the classroom; examines cultural awareness, human relations skills, and cross-cultural experiences, particularly appropriate for the elementary classroom.

Real Women Don't Do Math... Or Do They? Toronto, Ont: York University, 1985. videotape. 11 mins. **(S/SD)**

Describes a three-day seminar organized by Women In Science Hopefully (WISH) at York University for female high school students to have a positive encounter with mathematics; discusses math as the critical filter and shows some of the class work.

The Resource Revolution: The Revolution in Plastics Recycling. Washington, DC: Council for Solid Waste Solutions, 1991. videotape, 12 mins. **(S)**

Futuristic look at the development of recycling, especially plastics through a simulated classroom presentation; an attempt to get students involved and interested in recycling.

The Rotten Truth. New York: WNET/ Public Broadcasting System, 1989. videotape. 28 mins. **(E)**

A diverse group of youngsters examine the issue of garbage: its capacity to rot and the rate of decomposition, structure of landfills, and what is produced by a family of four; also discusses recycling, and reduction of potential garbage at source.

Rutgers Family Science. New Brunswick, NJ: Rutgers University, Consortium for Educational Equity, and Office of TV and Radio, 1992. videotape. 10 mins. **(E/SD)**

*Provides an overview and the distinct flavor of the program **Family Science** as conducted by the Englewood School District.*

Sandra, Claire, Dee & Zella: Four Women in Science. Newton, MA: Education Development Center, 1980. 16mm film. 19 mins. **(S)**

An astronomer, a veterinarian, a physicist and a membrane systems engineer discuss their work, and their family life; excellent portrayal of women working in nontraditional jobs.

Sarah the Welder. Boston: Massachusetts Educational Television, 1983. videotape. **(S)**

A high school student overcomes the prejudices of her boy friend, her teachers, parents and school administrators to be able to enroll in a welding class.

E = Elementary; S = Secondary; SD = Staff Development; G = General
Unless specified all videotapes are ½" VHS.

Science and Gender with Evelyn Fox Keller. Alexandria, VA: PBS Video, 1991. videotape. 30 mins.

Keller discusses with Bill Moyers how gender plays a significant role in the language that scientists use to describe their work and how scientific language reflects masculine metaphors and values.

Science Institute for Middle Schools Teachers. Sponsored by Bell Atlantic and the American Association for the Advancement of Science. Washington, DC: Bell Atlantic/AAAS, 1991. videotape. 12 mins. **(SD)**

Shows 2-week institute at George Washington University for middle school teachers in science and technology; motivates them to return to school to infuse new techniques and hands-on activities, as well as strategies to encourage girls and minority students.

Science Teams. New Brunswick: Rutgers University, Consortium for Educational Equity, and Office of TV and Radio, 1991. videotape + manual. 28 mins. **(E/SD)**

Demonstrates innovative project integrating cooperative learning with hands-on environmental science for 5th and 6th grades to enhance students' interest in science, especially girls and minorities; includes overview, classroom activities and extensive resource section.

Science: Women's Work. Washington, DC: National Science Foundation, 1982. 16mm film. 25 mins. **(S)**

This film portrays six women at work and at home; marine biologist, astronomer, geologist, science writer, psychologist, computer specialist. Includes minorities and provides good role models.

The Sky's the Limit. Washington, DC: Bryon Films, n.d. 16mm film. 20 mins. **(S)**

This film shows women in apprenticeship programs, including one in New Jersey, receiving training in nontraditional careers. Good exploratory film for all students.

Space for Women. Washington, DC: National Audiovisual Center, 198l. 16mm film. 27 mins. **(S)**

Produced by NASA, this visually beautiful film shows women working in a wide variety of jobs in the space program; includes astronauts in training, electrical and computer engineers, and a psychophysiologist among others. One drawback -- the narrator is Ricardo Montalban.

Stepping Out. Madison, WI: University of Wisconsin-Madison, Vocational Studies Center, n.d. 2 filmstrips, 2 audio tapes + guide. **(S/SD)**

Designed for women considering a job in a nontraditional area, these filmstrips provide career information and decision-making strategies.

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Take This Job and (Shove) Love It. Boise, ID: Idaho State Board of Vocational Education, 1988. videotape. 15 mins. **(S)**

Musical video shows young women in the workforce, especially in technical jobs; discusses stereotypes, relationships between young women and men, and career patterns.

Taking Tradition to Tomorrow. Boulder, Co: American Indian Science and Engineering Society, 1988. videotape. 27 mins. **(S)**

Shows the significant cultural and scientific contributions that Native Americans have made in science and medicine; features American Indians working in medicine, aerospace, linguistics and anthropology to serve as role models.

Teacher Education and Mathematics: A Course to Reduce Math Anxiety and Sex Role Stereotyping in Elementary Education. Newton, MA: Education Development Center, 1985. 9 vols, 2 audio tapes. **(SD)**

1, Instructor's Handbook; 2, Patterns; 3, Approximation and Estimation; 4, Metric Measurement; 5, Choice and Chance; 6, Demystifying Math; 7, Sex-Role Stereotyping in Mathematics Education; 8, Women, Mathematics and Careers; 9, Women as Mathematicians.

They Did It: So Can You! A career planning guide for minorities in engineering. New York: Minority Engineering Education, n.d. filmstrip, audio tape + guide. 10 mins. **(S)**

Features 4 engineers (Black, Hopi, Puerto Rican & Chicano) who discuss their training and their jobs, and factors influencing their choice in engineering.

Those People Are Really Doing Those Jobs. Sacramento, CA: California Department of Education, Project S.E.E., n.d. filmstrip, audio tape + guide. 10 mins. **(S)**

Filmstrip to encourage young people to explore and consider seriously nontraditional jobs.

Together We Can: An Awareness Training Program in Sex Role Stereotyping. Newton, MA: Educational Development Center, 1979. 3 kits: filmstrips, activities + guides. **(SD)**

These kits provide training and materials for different audiences: community groups and parents; preschool educators; and K-12 educators, in order to eliminate sex bias in programs, and in the treatment of students.

Tracing the Path: African American Contributions to Chemistry in the Life of Sciences. Washington, D.C.: American Chemical Society, 1991. videotape & guide. 18 mins. **(S)**

This historical overview of science in Africa presents indigenous medical, chemical and physical practices; it then goes on to highlight the contributions of African Americans in chemistry; short on women role models.

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Trade Secrets: Blue Collar Women Speak Out. San Francisco: Tradeswomen, Inc.; New York: Women Make Movies, 1985. videotape. 15 mins. **(S)**

Discusses the entry of women into the construction trades, men's reactions and the position of the unions; profiles an ironworker, electrician, welder, sprinkler fitter and an instructor.

A Truck Driver Named Gret. Philadelphia: a film by Ruth Levikoff, 1983. **(S)**

Gret, a driver for U.P.S., explains why she likes delivering parcels, and discusses her relationship with her family and also her coworkers.

Venture Beyond Stereotypes: A Workbook for Teachers Concerned With Sex Role Stereotyping. Newton, MA: Education Development Center, 1979. 8 videotapes + guide. **(SD/G)**

This program with notes to the television series Jack and Jill/Fiction and Fact *focuses on ways that stereotyped images of women and men promote sex bias and evidence of this bias in aspects of school and classroom practice.*

We All Count in Family Math. Berkeley, CA: University of California Lawrence Hall of Science, EQUALS, 1984. 16mm film & videotape. 20 mins. **(G)**

Shows new program for children, parents, and teachers working as a team to provide positive experiences in math; demonstrates new strategies concentrating in visual and hands-on ways of learning.

What If: Women Inventors and Entrepreneurs. London, Ontario, Canada: Women Inventors Project, 1990. videotape. 17 mins. **(S/G)**

Looks at the status of women in the area of inventing, some women discuss the difficulty of getting their inventions taken seriously.

Who's Working Here? Materials for Overcoming Sex Bias and Stereotyping in Employment. Mount Vernon, NY: Mid-Hudson Regional Project to Promote Sex Equity in Occupational Education, 1981. filmstrip, audio tape + guide. **(SD/G)**

Designed for use with business owners, this program examines traditional employment patterns and the development of hiring people in nontraditional jobs.

Why Not a Woman. Harrisburg, PA: Pennsylvania Department of Education, 1976. 16mm film. **(S)**

Examines women's work in the skilled trades, the reasons why women are entering such fields in greater numbers, and myths and stereotypes, vs. the reality of women in skilled trades world.

Why Not? Expand the Career Horizons of Girls. Westbury, NY: Nassau Board of Cooperative Educational Services, 1975. filmstrip, audio tape + guide. **(S)**

Explores the career choices of women in the skilled trades and shows the possibilities of working in nontraditional fields.

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Why Should I Stay Awake in Math Class? Washington, D. C.: Foundation for Biomedical Research, 1991. videotape. 10 mins. **(S)**

This video is designed to dispel youngsters' misconceptions about scientists and their work. Caught dozing in science class, Chris is assigned a word composition on why he should stay awake in science class. Out of a dream comes Sonia, his guardian teenager, to prove that the world is a laboratory and that science occurs everywhere.

Chris catches a glimpse of the excitement a science career offers. He learns that scientists are like detectives in their quest for answers.

Winning: Aerospace - The Next Decade. Reston, Va: Aerospace Industries Association, 1990. videotape. 21 mins. **(S)**

Shows many different careers in the aerospace industries to interest secondary school students.

A Winning Formula: A Program to Promote Sex Equity in Mathematics and Science. Brooklyn, NY: New York City Board of Education, Office of Equal Opportunity, 1986. videotape + guide. **(S)**

Interviews 6 female Westinghouse Science Talent Search winners, and helps students become aware of the importance of math and science.

With Silk Wings: Asian American Women at Work. San Francisco, CA: Asian American Women United, n.d. videotape. 30 mins. **(S)**

Excerpts from set of 4 videos show Asian American women working in professional and non-traditional careers, and examine challenges facing young women of Asian heritage.

Women and Science: Issues and Resources. Madison, WI: University of Wisconsin, 1984. videotape + guide. **(SD)**

Discusses issues of sex differences, feminist approaches to scientific objectivity and impact of science on women's lives. Features Women's Studies librarian discussing resources and research strategies in these areas.

Women at Work. Newton, MA: Education Development Center, 1981. filmstrip + guide. 20 mins. **(S)**

Three women- a repairer, an engineer and a painter- describe the challenge of their work from their own perspective and explain how they prepared for their careers.

Women at Work: Change, Choice, Challenge. Chicago: Encyclopedia Britannica Educational Corp., 1977. 16mm film. 19 mins. **(S)**

Women (including minority) in non-traditional jobs describe their work, their attitudes, and the barriers overcome to succeed. Jobs shown include refinery work, judge, surgeon, linesperson.

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Women in Math and Science: Electronic Field Trip. Annandale, VA: Fairfax County Public Schools, 1992. videotape and guide. Part I 30 mins; Part II 60 mins. **(S)**

Women in traditionally male fields and selected role models discuss the path they took through education to their present jobs; interactive teleconference provides interaction with women working on site in medicine, engineering, computer science and space.

Women in Science: Illustrated Interviews. Stony Brook, NY: American Association of Physics Teachers, 1975. slides, 3 audio tapes. **(S)**

Presents interviews with six successful scientists who talk about their backgrounds, how they became interested in science, their training and career specialty, and what it is like to be a woman in a traditionally male field.

Women in Science at IBM. Yorktown Heights, NY: IBM T.J. Watson Research Center, 1989. videotape. 11 mins. **(S)**

Women at work in mathematics and computer research discuss why they chose science, and who influenced them in their careers.

Women in Science Series: Computer Science, Careers for Women. Ann Arbor, MI: University of Michigan, School of Dentistry, 1984. videotape + guide. 30 mins. **(S)**

Six women describe the different routes and education they took to work with computers. Enthusiastic about their work, they range from a graphics designer working in films to a programmer studying the atmosphere.

Women in Science Series: Scientific Careers for Women, Doors to the Future. Ann Arbor, MI: University of Michigan School of Dentistry, 1986. videotape. 30 mins. **(S)**

Interviews women working in different branches of science and discusses their entry into science, their education and the combination of career and family life.

Women with Disabilities in Nontraditional Work Roles. Tuscon, AZ: Arizona School for the Deaf and Blind, 1985. videotape. 40 mins. **(S/SD)**

Interviews three women- a lawyer, a computer programmer and a center director- who have overcome their disabilities to create careers for themselves in their chosen field. Uses signing.

Women's Work: Engineering. Newton, MA: Education Development Center, 1977. 16mm film. 26 mins. **(S)**

Interviews with women civil, materials and chemical engineers discuss education and training necessary to become engineers; this film shows women at work and at home, providing excellent role models.

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A World in Motion; A Hands-On Science Program, Grades 4-6. Warrendale, PA: Society of Automotive Engineers International, 1990. videotape + kit, teacher's guide and posters. 20 mins. **(E)**

Designed to promote scientific literacy, this kit provides elementary teachers with activities to provide opportunities for science experiences and for developing problem solving and cooperative work; also encourages girls and minorities to consider engineering as a career.

Working Equal. Columbus, OH: National Center for Research in Vocational Education, 1986. 3/4" videotape. 10 mins. **(SD)**

Focuses on recruiting young women to nontraditional vocational careers.

You Can Be Anything. New York: Teaching Resources Film, 1975. 4 filmstrips, 4 audio tapes. **(S)**

Imaginative and entertaining program in which students choose careers for the future, unlimited by stereotyped roles.

You Can Be A Scientist, Too. Bethesda, MD: The Equity Institute, 1985. videotape. 13 mins. **(E)**

Accompanies a set of biographies of women scientists, and shows how everyday questioning can be the start of research; introduces young children to the scientific method.

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Research for Better Schools is a private, nonprofit corporation, which has served as the Mid-Atlantic regional education laboratory for over 25 years under funding from the U.S. Department of Education. RBS has also offered educational development, evaluation, technical assistance, and training services under client funding within the region, and operates a self-supporting publications division on a national basis.

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